

Lars Ruthotto

400 Dowman Dr, W408
30322 Atlanta, GA
United States

lruthotto@emory.edu
<http://www.mathcs.emory.edu/~lruthot/>

Education

Doctor of Natural Sciences, University of Münster, Germany, 2012, thesis entitled *Hyperelastic Image Registration - Theory, Numerical Methods, and Applications*, advisors: Martin Burger and Jan Modersitzki.

Diploma in Mathematics, University of Münster, Germany, 2010.

Full-time Positions

Winship Distinguished Research Associate Professor, Departments of Mathematics and Computer Science, Emory University, since Sept. 2023.

Associate Professor, Departments of Mathematics and Computer Science, Emory University, Sept. 2020 - Aug. 2023.

Assistant Professor, Departments of Mathematics and Computer Science, Emory University, Sept. 2014 - Aug. 2020.

Postdoctoral Research Fellow, Department of Mathematics / Earth and Ocean Sciences, University of British Columbia, Canada, Jan. 2013 - Aug. 2014.

Research and Teaching Assistant, Institute of Mathematics and Image Computing, University of Lübeck, Germany, Oct. 2010 - Dec. 2012.

Research Assistant, Institute of Biomagnetism and Biosignalanalysis, University of Münster, Germany, Aug. and Sept. 2010.

Research and Teaching Assistant, Institute for Computational and Applied Mathematics, University of Münster, Germany, April 2010 - July 2010.

Other Positions

Senior Fellow, Institute for Pure and Applied Mathematics (IPAM), Long program on Machine Learning for Physics and the Physics of Learning, Sept. 2019 - Dec. 2019.

Research Consultant, XTract Technologies Inc. (Vancouver, Canada), Jan. 2017 - Sept. 2019.

Research Interests

My research lies at the intersection of computational mathematics and artificial intelligence. I develop algorithms that make AI models more efficient, stable, and interpretable, and I use AI to address challenging problems in numerical modeling, inference, and control. My methods are rooted in numerical algorithms for differential equations (ODEs, SDEs, PDEs) and tools from numerical analysis, high-performance computing, optimal transport, and optimal control.

As a scientific computing expert working in AI, I study continuous-time deep learning, treating neural networks as dynamical systems that can be analyzed and trained with established numerical methods, along with optimal-transport-based generative models, faster optimizers that exploit problem structure, leaner architectures, and mixed-precision algorithms for training quantized networks. As an AI/ML researcher working on computational mathematics, I use neural networks to approximate value functions and transport

maps, enabling high-dimensional optimal control, mean field games, and Bayesian inverse problems while incorporating structure from HJB equations and the Pontryagin Maximum Principle; I also work on learnable iterative solvers that accelerate challenging PDE simulators.

Publications

Submitted Papers and Preprints

- [P.7] Leburu R, Nurbekyan L, Ruthotto L
[Differentiating through Stochastic Differential Equations: A Primer](#)
arXiv preprint arXiv:2601.08594 [math.NA], 2026
- [P.6] Keegan K, Ruthotto L
[Manifold-Aware Perturbations for Constrained Generative Modeling](#)
arXiv preprint arXiv:2601.23151 [cs.LG], 2026
- [P.5] Celledoni E, Owren B, Ruthotto L, Yang N
[Mixed Precision Training of Neural ODEs](#)
arXiv preprint arXiv:2510.23498 [None], 2025
- [P.4] Kan K, Nagy JG, Ruthotto L
[Avoiding The Double Descent Phenomenon of Random Feature Models Using Hybrid Regularization](#)
arXiv preprint arXiv:2012.06667 [None], 2020
- [P.3] Onken D, Ruthotto L
[Discretize-Optimize vs. Optimize-Discretize for Time-Series Regression and Continuous Normalizing Flows](#)
arXiv preprint arXiv:2005.13420 [None], 2020
- [P.2] Treister E, Ruthotto L, Sharoni M, Zafrani S, Haber E
[Low-Cost Parameterizations of Deep Convolution Neural Networks](#)
arXiv preprint arXiv:1805.07821 [None], 2018
- [P.1] Haber E, Lucka F, Ruthotto L
[Never Look Back - A Modified EnKF Method and its Application to the Training of Neural Networks without Back Propagation](#)
arXiv preprint arXiv:1805.08034 [None], 2018

Journal Articles (all peer-reviewed)

- [J.43] Ferguson A, LaFleur M, Ruthotto L, Thaler J, Ting Y, Tiwary P, Villar S
[The Future of Artificial Intelligence and the Mathematical and Physical Sciences \(AI+MPS\)](#)
Machine Learning: Science and Technology, 7(2), pp. 023001, 2026
- [J.42] Wang Z, Baptista R, Marzouk Y, Ruthotto L, Verma D
[Efficient Neural Network Approaches for Conditional Optimal Transport with Applications in Bayesian Inference](#)
SIAM Journal on Scientific Computing, 2025
- [J.41] Dávid G, Fricke B, Oeschger J, Ruthotto L, Fritz F, Ohana O, Mordhorst L, Sauvigny T, Freund P, Tabelow K, Mohammadi S
[ACID: A comprehensive toolbox for image processing and modeling of brain, spinal cord, and ex vivo diffusion MRI data](#)
bioRxiv, 2024
- [J.40] Ruthotto L
[Differential Equations for Continuous-Time Deep Learning](#)
Notices of the American Mathematical Society, 2024

- [J.39] Hagemann P, Ruthotto L, Steidl G, Yang N
[Multilevel Diffusion: Infinite Dimensional Score-Based Diffusion Models for Image Generation](#)
SIAM Journal on Mathematics of Data Science, 2024
- [J.38] Verma D, Winovich N, Ruthotto L, Waanders B
[Neural network approaches for parameterized optimal control](#)
Foundations of Data Science, 2024
- [J.37] Julian A, Ruthotto L
[PyHySCO: GPU-enabled susceptibility artifact distortion correction in seconds](#)
Frontiers in Neuroscience, 2024
- [J.36] Dunbar A, Ruthotto L
[Alternating Minimization for Regression with Tropical Rational Functions](#)
Algebraic Statistics, 2023
- [J.35] Kan K, Nagy JG, Ruthotto L
[LSEMINK: a modified Newton–Krylov method for Log-Sum-Exp minimization](#)
Electronic Transactions on Numerical Analysis, pp. 618-635, 2023
- [J.34] Newman E, Ruthotto L
['hessQuik': Fast Hessian computation of composite functions](#)
Journal of Open Source Software, 2022
- [J.33] Li X, Verma D, Ruthotto L
[A Neural Network Approach for Stochastic Optimal Control](#)
SIAM Journal on Scientific Computing, 46(5), pp. C535-C556, 2022
- [J.32] Onken D, Nurbekyan L, Li X, Wu Fung S, Osher S, Ruthotto L
[A Neural Network Approach for High-Dimensional Optimal Control Applied to Multiagent Path Finding](#)
IEEE Transactions on Control Systems Technology, 2021
- [J.31] Ruthotto L, Haber E
[An introduction to deep generative modeling](#)
GAMM-Mitteilungen, 2021
- [J.30] Newman E, Chung J, Chung M, Ruthotto L
[slimTrain - A Stochastic Approximation Method for Training Separable Deep Neural Networks](#)
SIAM Journal on Scientific Computing, 44(4), pp. 1419-1457, 2021
- [J.29] Sharma M, Hahn M, Sven, Leyffer, Ruthotto L, van B, Waanders B
[Inversion of convection–diffusion equation with discrete sources](#)
Optimization and Engineering, 2020
- [J.28] Eliasof M, Ephrath J, Ruthotto L, Treister E
[MGIC: Multigrid-in-Channels Neural Network Architectures](#)
SIAM Journal on Scientific Computing, pp. S307-S328, 2020
- [J.27] Kan K, Wu Fung S, Ruthotto L
[PNKH-B: A Projected Newton-Krylov Method for Large-Scale Bound-Constrained Optimization](#)
SIAM Journal on Scientific Computing, 2020
- [J.26] Newman E, Ruthotto L, Hart J, Waanders B
[Train Like a \(Var\)Pro: Efficient Training of Neural Networks with Variable Projection](#)
SIAM Journal on Mathematics of Data Science, 3(4), 2020

- [J.25] Ruthotto L, Osher S, Li W, Nurbekyan L, Wu Fung S
[A machine learning framework for solving high-dimensional mean field game and mean field control problems](#)
 Proceedings of the National Academy of Sciences of the United States of America, 117(17), pp. 9183-9193, 2019
- [J.24] Wu Fung S, Tyrväinen S, Ruthotto L, Haber E
[ADMM-Softmax: an ADMM approach for multinomial logistic regression](#)
 Electronic Transactions on Numerical Analysis, pp. 214-229, 2019
- [J.23] Ephrath J, Eliasof M, Ruthotto L, Haber E, Treister E
[LeanConvNets: Low-Cost Yet Effective Convolutional Neural Networks](#)
 IEEE Journal on Selected Topics in Signal Processing, 14(4), pp. 894-904, 2019
- [J.22] Tabelow K, Balteau E, Ashburner J, Callaghan M, Draganski B, Helms G, Kherif F, Leutritz T, Lutti A, Phillips C, Reimer E, Ruthotto L, Seif M, Weiskopf N, Ziegler G, et al.
[hMRI – A toolbox for quantitative MRI in neuroscience and clinical research](#)
 NeuroImage, 2019
- [J.21] Mustonen L, Gao X, Santana A, Mitchell R, Vigfusson Y, Ruthotto L
[A Bayesian framework for molecular strain identification from mixed diagnostic samples](#)
 Inverse Problems, 2018
- [J.20] Wu Fung S, Ruthotto L
[An Uncertainty-Weighted Asynchronous ADMM Method for Parallel PDE Parameter Estimation](#)
 SIAM Journal on Scientific Computing, 41(5), 2018
- [J.19] Ruthotto L, Haber E
[Deep Neural Networks Motivated by Partial Differential Equations](#)
 Journal of Mathematical Imaging and Vision, 2018
- [J.18] Herring J, Nagy JG, Ruthotto L
[Gauss-Newton Optimization for Phase Recovery From the Bispectrum](#)
 IEEE Transactions on Computational Imaging, pp. 235-247, 2018
- [J.17] Macdonald J, Ruthotto L
[Improved Susceptibility Artifact Correction of Echo-Planar MRI using the Alternating Direction Method of Multipliers](#)
 Journal of Mathematical Imaging and Vision, 2018
- [J.16] Herring J, Nagy JG, Ruthotto L
[LAP: A Linearize and Project Method for Solving Inverse Problems with Coupled Variables](#)
 Sampling Theory, Signal Processing, and Data Analysis, 2018
- [J.15] Günther S, Ruthotto L, Schroder J, Cyr E, Gauger N
[Layer-Parallel Training of Deep Residual Neural Networks](#)
 SIAM Journal on Mathematics of Data Science, 2(1), pp. 1-23, 2018
- [J.14] Lin C, Veneziani A, Ruthotto L
[Numerical methods for polyline-to-point-cloud registration with applications to patient-specific stent reconstruction](#)
 International Journal for Numerical Methods in Biomedical Engineering, 34(3), 2018
- [J.13] Ruthotto L, Chung J, Chung M
[Optimal Experimental Design for Inverse Problems with State Constraints](#)
 SIAM Journal on Scientific Computing, 40(4), pp. B1080-B1100, 2018

- [J.12] Mang A, Ruthotto L
[A Lagrangian Gauss-Newton-Krylov Solver for Mass- and Intensity-Preserving Diffeomorphic Image Registration](#)
 SIAM Journal on Scientific Computing, 39(5), pp. B5860-B5885, 2017
- [J.11] Wu Fung S, Ruthotto L
[A multiscale method for model order reduction in PDE parameter estimation](#)
 Journal of Computational and Applied Mathematics, pp. 19-34, 2017
- [J.10] Ruthotto L, Greif C, Modersitzki J
[A stabilized multigrid solver for hyperelastic image registration](#)
 Numerical Linear Algebra with Applications, 2017
- [J.9] Chung J, Ruthotto L
[Computational methods for image reconstruction](#)
 NMR in Biomedicine, 2017
- [J.8] Haber E, Ruthotto L
[Stable architectures for deep neural networks](#)
 Inverse Problems, 2017
- [J.7] Ruthotto L, Treister E, Haber E
[jInv-a Flexible Julia Package for PDE Parameter Estimation](#)
 SIAM Journal on Scientific Computing, 39(5), pp. S702-S722, 2016
- [J.6] Mohammadi S, Tabelow K, Ruthotto L, Feiweier T, Polzehl J, Weiskopf N
[High-resolution diffusion kurtosis imaging at 3T enabled by advanced post-processing](#)
 Frontiers in Neuroscience, 2015
- [J.5] Haber E, Ruthotto L
[A multiscale finite volume method for Maxwell's equations at low frequencies](#)
 199(2), pp. 1268-1277, 2014
- [J.4] Fohring J, Haber E, Ruthotto L
[Geophysical Imaging of Fluid Flow in Porous Media](#)
 SIAM Journal on Scientific Computing, 36(5), pp. S218-S236, 2014
- [J.3] Burger M, Modersitzki J, Ruthotto L
[A Hyperelastic Regularization Energy for Image Registration](#)
 SIAM Journal on Scientific Computing, 35(1), pp. B132-B148, 2013
- [J.2] Ruthotto L, Ruthotto L, Kugel H, Olesch J, Fischer B, Modersitzki J, Burger M, Wolters C
[Diffeomorphic susceptibility artifact correction of diffusion-weighted magnetic resonance images](#)
 Physics in Medicine and Biology, 2012
- [J.1] Gigengack F, Ruthotto L, Burger M, Wolters C, Jiang X, Schäfers K
[Motion Correction in Dual Gated Cardiac PET Using Mass-Preserving Image Registration](#)
 IEEE Transactions on Medical Imaging, 31(3), pp. 698-712, 2012

Book Chapter

- [B.1] Ruthotto L, Modersitzki J
[Non-linear Image Registration](#)
 Handbook of Mathematical Methods in Imaging, pp. 2005-2051, 2015

Selected Peer-Reviewed Conference Proceedings

- [C.19] Madondo M, Verma D, Ruthotto L, Yong N
[Learning Control Policies of Hodgkin-Huxley Neuronal Dynamics](#)
arXiv.org, 2023
- [C.18] Eliasof M, Ruthotto L, Treister E
[Improving Graph Neural Networks with Learnable Propagation Operators](#)
International Conference on Machine Learning, 2022
- [C.17] Kan K, Aubet F, Januschowski T, Park Y, Benidis K, Ruthotto L, Gasthaus J
[Multivariate Quantile Function Forecaster](#)
International Conference on Artificial Intelligence and Statistics, 2022
- [C.16] Eliasof M, Ephrath J, Ruthotto L, Treister E
[Multigrid-in-Channels Architectures for Wide Convolutional Neural Networks](#)
Copper Mountain Conference on Multigrid Methods; NeurIPS 2021 Workshop on Deep Learning and PDEs, 2021
- [C.15] Onken D, Nurbekyan L, Li X, Wu Fung S, Osher S, Ruthotto L
[A Neural Network Approach Applied to Multi-Agent Optimal Control](#)
European Control Conference, 2020
- [C.14] Onken D, Wu Fung S, Li X, Ruthotto L
[OT-Flow: Fast and Accurate Continuous Normalizing Flows via Optimal Transport](#)
AAAI Conference on Artificial Intelligence, 2020
- [C.13] Haber E, Lensink K, Treister E, Ruthotto L
[IMEXnet: A Forward Stable Deep Neural Network](#)
International Conference on Machine Learning, 2019
- [C.12] Ephrath J, Ruthotto L, Haber E, Treister E
[LeanResNet: A Low-cost yet Effective Convolutional Residual Networks](#)
International Conference on Machine Learning, 2019
- [C.11] Haber E, Ruthotto L, Holtham E
[Learning Across Scales - Multiscale Methods for Convolution Neural Networks](#)
AAAI Conference on Artificial Intelligence, 2018
- [C.10] Chang B, Meng L, Haber E, Ruthotto L, Begert D, Holtham E
[Reversible Architectures for Arbitrarily Deep Residual Neural Networks](#)
AAAI Conference on Artificial Intelligence, 2017
- [C.9] März M, Ruthotto L
[Combined Background Field Removal and Reconstruction for Quantitative Susceptibility Mapping](#)
Bildverarbeitung für die Medizin, 2016
- [C.8] Ruthotto L, Mohammadi S, Weiskopf N
[A new method for joint susceptibility artefact correction and super-resolution for dMRI](#)
Medical Imaging, 2014
- [C.7] Heck C, Ruthotto L, Modersitzki J, Berkels B
[Model-Based Parameterestimation in DCE-MRI Without an Arterial Input Function](#)
Bildverarbeitung für die Medizin, 2014
- [C.6] Ruthotto L, Mohammadi S, Heck C, Modersitzki J, Weiskopf N
[HySCO - Hyperelastic Susceptibility Artefact Correction of DTI in SPM](#)
Bildverarbeitung für die Medizin, pp. 344-349, 2013

- [C.5] Ruthotto L, Gigengack F, Burger M, Wolters C, Jiang X, Schäfers K, Modersitzki J
[A Simplified Pipeline for Motion Correction in Dual Gated Cardiac PET](#)
 Bildverarbeitung für die Medizin, pp. 51-56, 2012
- [C.4] Gigengack F, Ruthotto L, Jiang X, Modersitzki J, Burger M, Hermann S, Schäfers K
[Atlas-Based Whole-Body PET-CT Segmentation Using a Passive Contour Distance](#)
 MCV, 2012
- [C.3] Ruthotto L, Hodneland E, Modersitzki J
[Registration of Dynamic Contrast Enhanced MRI with Local Rigidity Constraint](#)
 Workshop on Biomedical Image Registration, pp. 190-198, 2012
- [C.2] Olesch J, Ruthotto L, Kugel H, Skare S, Fischer B, Wolters C
[A variational approach for the correction of field-inhomogeneities in EPI sequences](#)
 Medical Imaging, 2010
- [C.1] Gigengack F, Ruthotto L, Burger M, Wolters C, Jiang X, Schafers K
[Motion correction of cardiac PET using mass-preserving registration](#)
 IEEE Nuclear Science Symposium & Medical Imaging Conference, pp. 3317-3319, 2010

Contributed and Invited Talks

Optimal Transport and PDE Perspectives on Generative AI, [plenary talk at the Southeast Applied and Computational Math Student Workshop \(ACM 2026\)](#), Emory University, April 2026.

Computational Mathematics and AI, ten-lecture series as Principal Lecturer at the NSF-CBMS Regional Conference on Research at the Interface of Applied Mathematics and Machine Learning, University of Houston, December 2025.

Mixed-Precision Algorithms for Training Neural ODEs, held at various occasions, including:

[invited talk at the Institute for Pure and Applied Mathematics \(IPAM\)](#), July 2025

invited talk at Gran Sasso Science Institute (GSSI), L'Aquila, Italy, May 2025

Neural ODEs/SDE Approaches for High-Dimensional Optimal Transport and Generative Modeling, held at various occasions, including:

AFOSR Computational Mathematics program review sessions, August 2024

mini symposium talk in MS42 at SIAM Mathematics of Data Science, Atlanta, October 2024

Differential Equations for Continuous-Time Deep Learning, held at various occasions, including:

invited seminar talk PSU-Purdue-UMD Joint Seminar on Mathematical Data Science, online, November 2024

invited talk at Oak Ridge National Laboratory, December 2024

invited talk at CSIP seminar, Georgia Tech, April 2024

invited talk at International Inverse Problems Zoom Seminar, April 2024

invited talk at the Institute of Mathematics and Image Computing, Lübeck University, August 2024

Bridging Continuous-Time Deep Learning and Image Registration, invited seminar talk (by David Fuentes), Imaging Physics Monthly Seminar, MD Anderson, March 2024.

Neural Networks for Optimal Control and Generative Modeling, invited talk at IPAM MLP219 Reunion, Lake Arrowhead, December 2023.

Hamilton Jacobi Bellman Approaches for Digital Twins, short talk at workshop Santa Fe Institute Workshop on Foundational Research for Digital Twins, September 2023.

Deep Ordinary and Partial Differential Equations, invited talk at the workshop on Differential Equations and Continuous-Time Deep Learning, Dagstuhl, Aug 2022.

[How to Train Better: Exploiting the Separability of DNNs](#), Simons Institute Workshop on Dynamics and Discretization: PDEs, Sampling, Optimization, joint talk with Elizabeth Newman, Oct 2021.

Machine Learning Approaches for High-Dimensional Optimal Transport and Control, held in different versions at various occasions including:

invited talk in e-seminar for Scientific Machine Learning, Nov 2022.

invited talk at the IPAM HJRC1 Reunion workshop, January 2022.

invited seminar talk at the Institute of Computing, Universita della Svizzera italiana (USI), February 2022 (virtual)

invited seminar talk at Courant Institute, February 2022 (virtual)

invited seminar talk at the UNRAVEL project meeting, June 2021 (virtual)

invited seminar talk at the DAMUT Colloquium at University of Twente, May 2021 (virtual)

invited mini symposium talk at the CAIMS Annual Meeting, July 2021 (virtual)

invited seminar talk at the Berlin "Oberseminar" on Optimization, Control and Inverse Problems, May 2021 (virtual)

invited seminar talk at the COMinDS Seminar seminar, May 2021 (virtual)

invited seminar talk at the Twente Applied Math Colloquium, May 2021 (virtual)

A Machine Learning Framework for Mean Field Games and Optimal Control, held in different versions at various occasions including:

invited talk at the AFOSR Computational Mathematics program review sessions, August 2021 (virtual), August 2022 (virtual), August 2023

invited talk in the Continuum Mechanics Seminar at University of Nebraska-Lincoln, November 2021 (virtual)

invited talk at the Oberwolfach Workshop on Computation and Learning in High Dimensions, August 2021 (virtual)

invited talk at the Deep learning and partial differential equations workshop at Isaac Newton Institute, November 2021 (virtual)

[An Introduction to Generative Modeling](#), held at various occasions including:

contributed 50 minute tutorial (virtual) for students, MS 65, SIAM Annual Meeting 2022.

invited 1-hour guest lecture at the University of Nuremberg-Erlangen, June 2021 (virtual).

invited 3-hour workshop at the University of South Carolina, April 2021 (virtual)

New Bridges between Deep Learning and Partial Differential Equations, held at various occasions including

invited seminar talk in the DNA seminar at the Norwegian University of Science and Technology NTNU, April 2021 (virtual)

[invited plenary talk at the Second Joint SIAM/CAIMS Annual Meeting \(AN20\), Toronto, July 2020 \(virtual\)](#)

A Machine Learning Framework for High-Dimensional Optimal Transport, held at various occasions including

invited applied math seminar talk at National University of Singapore, January 2021 (virtual)

invited talk in the IMA Data Science Seminar, April 2021 (virtual)

[contributed talk at SIAM CSE 2021, February 2021 \(virtual\)](#)

invited talk in the Sayas Numerics Seminar, October 2020 (virtual)

invited talk in the One World Seminar on Mathematics for Arbitrary Data Sources, April 2020 (virtual)

invited talk at the Institute for Pure and Applied Mathematics workshop on Deep Learning with Medical Applications, January 2020.

invited talk at the Lake Arrowhead culminating workshop of IPAM's MLP 2019 program, December 2019.

Deep Neural Networks motivated by PDEs, held at various occasions including

invited talk at the Institute for Pure and Applied Mathematics, September 2019

invited talk at the Institute for Mathematics and Image Computing, Lübeck, July 2019

invited talk at Banff International Research Station, July 2019

contributed talk at ICIAM 2019, July 2019

invited talk at OakRidge National Lab, July 2019

contributed talk at SIAM Conference on Computer Science and Engineering, February 2019

invited talk at Georgia State University, October 2018

invited talk at the University of Florida ISE Risk Management Workshop, October 2018

invited plenary lecture at the Finite Element Symposium, Chemnitz, Germany, September 2018

invited talk at Sandia National Laboratory, Albuquerque, August 2018

contributed talk at SIAM Conference on Imaging Sciences, Bologna, Italy, June 2018

invited talk at the Cantab Capital Institute for the Mathematics of Information, Cambridge, UK, May 2018

invited talk at Mini-Workshop on Inverse Problems and Deep Learning, Oberwolfach, March 2018.

A Numerical Analysis Perspective on Deep Neural Networks, held at various occasions including

invited seminar talk at North Carolina State University, April 2021 (virtual)

invited talk at the IPAM Workshop From Passive to Active: Generative and Reinforcement Learning with Physics, September 2019

Optimal Control Methods for Training Deep Neural Networks, held at various occasions including

contributed talk at ICIAM 2019, July 2019

contributed talk at SIAM Conference on Imaging Sciences, Bologna, Italy, June 2018

invited seminar talk at UCLA, April 2018

invited seminar talk at UT Austin, April 2018

contributed talk at the 15th Copper Mountain Conference on Iterative Methods, March 2018

invited seminar talk at IBM TJ Watson Research Center, January 2018.

invited seminar talk at Courant Institute, New York University, November 2017.

invited talk at workshop on Variational methods and effective algorithms for imaging and vision, Isaac Newton Institute, Cambridge, November 2017.

A Lagrangian Solver for Diffeomorphic Image Registration, held at various occasions including:

contributed talk at SIAM Conference on Imaging Sciences, Bologna, Italy, June 2018

contributed talk in mini symposium at SIAM Conference on Computer Science and Engineering, Atlanta, GA, 2017.

invited colloquium talk at Institute for Mathematics and Image Computing, University of Lübeck, July 2016.

A Bayesian framework for molecular strain identification from mixed diagnostic samples, held at:
invited colloquium talk at the Advanced Molecular Detection (AMD) seminar at the CDC, Atlanta, July 2018.

Dynamic Inverse Problems in Deep Learning

invited colloquium talk at Institute for Mathematics and Image Computing, University of Lübeck, July 2017.

invited seminar talk at Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany, July 2017

contributed talk in mini symposia on Non-standard Regularisation at Applied Inverse Problems, Hangzhou, China, June, 2017.

LAP: a Linearize and Project Method for Solving Coupled Inverse Problems, contributed talk in mini symposia on Hybrid models for inverse imaging problems at Applied Inverse Problems, Hangzhou, China, May, 2017.

A Multigrid Preconditioner for Hyperelastic Image Registration

contributed talk in mini symposium at International Conference on Preconditioning Techniques, Vancouver, Aug 2017.

contributed talk in mini symposium at SIAM Conference on Imaging Sciences, Hong Kong, May 2014.

Tutorial on PDE-Constrained Optimization with Julia, invited talk at SAMSI Workshop on Mixed-Integer PDE-Constrained Optimization, Raleigh, NC, March 30, 2017.

Optimal Experimental Design for Constrained Inverse Problems

invited talk at SAMSI Transition Workshop, Raleigh, NC, May 1, 2017.

invited talk at SAMSI Workshop on Statistical Inverse Problems, Raleigh, NC, January 26, 2017.

Perspectives on Diffeomorphic Image Registration,

invited talk at Weill Cornell Medicine, New York City, NY, February 2017

invited talk at Georgia Institute of Technology, Atlanta, GA, October 2016

jInv - A Flexible Julia Package for Parallel PDE Parameter Estimation,

contributed e-poster at SIAM Conference on Computer Science and Engineering, Atlanta, GA, 2017.

invited colloquium talk at Virginia Tech, Blacksburg, VA, September 2016

contributed talk at JuliaCon, Boston, MA, June 2016

invited talk in ICES seminar, University of Texas at Austin, TX, March 2015.

contributed talk, 14th Copper Mountain Conference on Iterative Methods, Copper Mountain, CO, March 2015.

contributed talk in mini symposium on Numerical Methods and Scientific Computing, AMS Southeastern Sectional Meeting, Athens, GA, 2015.

Efficient Iterative Methods for Quantitative Susceptibility Mapping

invited talk at Imaging Group, University of Münster, Germany, July 2017.

contributed talk in mini symposium on Efficient Algorithms for Large-scale Inverse Problems in Medical Imaging, SIAM Conference on Imaging Sciences, Albuquerque, May 2016.

contributed talk in mini symposium on Recent Advances in Numerical Linear Algebra for Inverse Problems, SIAM Conference on Applied Linear Algebra, Atlanta, Oct 2015.

Optimization Through Multiscale Methods

contributed talk in mini symposium on PDE-Constrained Optimization with Reduced Order Models, SIAM Conference on Optimization, Vancouver, Canada, May 2017.

contributed talk in mini symposium on Multiscale and Reduced Space Modeling, SIAM Conference on Geoscience, Stanford, CA, June 2015.

Numerical Methods for Hyperelastic Image Registration, 60 minutes lecture, held at various occasions including:

invited talk at Ferenc Jolesz Research Seminar, Brigham and Women's Hospital, Boston, MA, USA, April 2015

invited talk at Mathematics Colloquium at Emory University, Atlanta, USA, January 2014

invited talk at Mathematics Colloquium at University of Bergen, Bergen, Norway, March 2014

invited talk at Geometry Seminar, University of Georgia, Athens, November 2014.

Undergraduate Teaching Experience

(ordered by course number)

Math 276 Honors Vector Calculus
Emory University, Atlanta, Spring 2024.

Math 275 Honors Linear Algebra
Emory University, Atlanta, Fall 2023.

MATH 485 Convex Optimization,
Emory University, Atlanta, Fall 2022.

MATH 347 Introduction to Nonlinear Optimization,
Emory University, Atlanta, Fall 2016, Fall 2018, Spring 2020, Spring 2023.

MATH 346 Introduction to Optimization Theory,
Emory University, Atlanta, Fall 2014, Spring 2015.

MATH 315 Numerical Analysis,
Emory University, Atlanta, Fall 2017 and Spring 2019.

MATH 211 Advanced Calculus,
Emory University, Atlanta, Fall 2016, Fall 2024.

Linear Algebra and Discrete Structures with Bernd Fischer,
University of Lübeck, Germany, October 2010 - September 2012,
Responsibilities included several lectures, organization of weekly tutorials, supervision of teaching assistants, preparation of weekly homework assignments and final exams.

Numerical Partial Differential Equations with Frank Wübbeling,
University of Münster, Germany, April – September 2010,
Responsibilities included weekly tutorials and homework assignments.

Graduate Teaching Experience

(ordered by course number)

MATH 789R RTG Seminar on Computational Mathematics for Data Science
Emory University, Atlanta, GA, USA, Fall 2021.

MATH 789R Bayesian Inverse Problems and Uncertainty Quantification
Emory University, Atlanta, GA, USA, Spring 2016.

MATH 785R Deep Generative Modeling
Emory University, Atlanta, GA, USA, Spring 2025.

MATH 771 (now MATH 517) Numerical Optimization
Emory University, Atlanta, GA, USA, Fall 2015, Fall 2018, Spring 2022.

CS 584/MATH 789R Numerical Methods for Deep Learning
Emory University, Atlanta, GA, USA, Spring 2018, Spring 2020.

MATH 516 Numerical Analysis II,
Emory University, Atlanta, GA, USA, Spring 2015.

Undergraduate Advisees

Rishi Leburu, [Differentiating through Stochastic Differential Equations: A Primer](#), **Honors Project** (with Dr. Levon Nurbekyan as main advisor), Emory University, September 2025 – March 2026.

Warin Watson, Cash Cherry, Rachele Lang, [Applications of Automatic Differentiation in Image Registration](#), **Emory CMDS REU 2024**, June 2024 – August 2024.

Oliver Wang, [Efficient Neural Network Approaches for Conditional Optimal Transport with Applications in Bayesian Inference](#), June 2022 – May 2023. Now a PhD student at MIT.

Zoe Ji, *Sketching Methods for Machine Learning*, **Honors Project** (co-advisor), Emory University, September 2023- March 2024. Now a PhD student at Stanford

Yixiao (Tommy) Chen, *Variable Projection for Input Convex Neural Networks*, **Honors Project**, Emory University, September 2022 – March 2023.

Dewan Chowdhury, Arjun Sethi-Olowin, Jacob Mantooth, *Reinforcement Learning vs. Optimal Control for the Mountain Car Problem*, **Emory REU/RET Computational Mathematics for Data Science**, Summer 2022.

Xindi Gong, *Linear Programming Approaches for Reinforcement Learning*, **Honors Project**, Emory University, September 2021 – March 2022.

Yu-Jan Ting, *Variance Reduction Methods for Neural Network-Based Optimal Control*, **Honors Project**, Emory University, September 2021 – March 2022.

Elle Buser, Emma Hart, Ben Hueneman, Justin Smith (in-service K-5 teacher), *Image-based diagnosis of Chiari malformation*, **Emory REU/RET Computational Mathematics for Data Science**, Summer 2021.

Uriel Yang, *Estimating and Predicting the Effect of Quarantine in the COVID-19 Pandemic: Using a Modified SEIR Model*, **Honors Project**, Emory University, April 2019 – March 2020.

Emily Rexer, Esteban Ramos, Ishan Saran, *A Monetary Evaluation of Ecosystem Services*, **Outstanding Winners in the 2019 Interdisciplinary Contest in Modeling (ICM)**. The team was among the top 8 submissions of 4,852 teams and their paper was selected for publication in the UMAP Journal.

Neeharika Kotte and Haoruo Zhao, *Lagrangian Methods for Optimal Mass Transport*, **Summer Research Experience** in Summer 2019.

Evan Scope Crafts, *Multiscale Training of Deep Neural Networks*, **Honors Project, Research Partners Program, Summer Undergraduate Research Experience 2018** Emory University, Jan. 2018 – March 2019; PhD student in Computational Science and Engineering at U of Texas at Austin, since Aug. 2019.

Qihang Zhang, *Stable Discretization of Variational Problems in Deep Learning*, **Honors Project and Summer Undergraduate Research Experience 2018**, Emory University, Jan. 2018 – March 2019. MSc in Data Science at GA tech, since in Aug. 2019.

Kathy Wu, *Trainable Krylov Methods for Inverse Problems*, **Honors Project**, Emory University, April

2018 – March 2019. MSc in Data Science at U of Chicago, since Aug. 2019.

Cayce Rimland and Daniel Flores, *Combined reconstruction and classification with deep neural networks*, **Summer Research Experience** in Summer 2018. Rimland is now in PhD program at UC Riverside and Flores joined Purdue University as PhD student.

Huiying Zhu, *Global Optimization in Image Registration*, **Honors Project** (with Dr. Manuela Manetta), Emory University, Dec 2016 – Dec. 2017; MSc in Data Science at GA tech, since Aug 2018.

Claire Lin, *Line-to-Point Registration with Applications in Coronary Stent Reconstruction*, **Honors Project** (with Dr. Alessandro Veneziani), Emory University, Sep. 2015 – April 2016. PhD student at U of Michigan, since Aug. 2016.

Graduate Advisees

Warin Watson, *Mixed Precision Algorithms and Graph Neural Networks*, since August 2025.

Katherine Keegan, *Generative Models on Manifolds*, since September 2024.

Haley Rosso, *Data Assimilation and Simulation Based Inference in Storm Surge Modeling*, co-advised with Talea Mayo, collaborative project between Sandia National Laboratories and Emory, since January 2022.

Abigail Julian, *Automatic Hyperparameter Tuning in Physics-Based Distortion Correction for Diffusion Tensor Imaging*, PhD in Computer Science and Informatics, **Awarded an NSF Graduate Research Fellowship**, January 2020 – May 2024. Now Teaching Assistant Professor in Computer Science, Emory.

Malvern Madondo, *Applications of Closed-loop Control in Biomedical Interventions: From Neural Modulation to Diabetes Management*, PhD in Computer Science and Informatics, **Awarded a Google PhD Fellowship**, Emory, January 2020 – May 2024. Now Postdoctoral Fellow at University of Chicago.

Xingjian Li, *Improving Sampling and Function Approximation in Machine Learning Methods for Solving Partial Differential Equations*, PhD in Computational Mathematics, Emory, January 2020 – May 2024. Now Postdoctoral Fellow at UT Austin.

Derek Onken, *Optimal Control Approaches for Designing Neural Ordinary Differential Equations*, PhD in Computer Science and Informatics, Emory, September 2018 – March 2021. Now a scientific researcher at Eli Lilly.

Kelvin Kan, *Numerical Optimization in Semantic Segmentation and Inverse Problems*, PhD project in Computational Mathematics, Emory, January 2019-March 2023. Now a Visiting Assistant Professor at UCLA.

Samy Wu Fung, *Large-Scale PDE Parameter Estimation*, PhD in Computational Mathematics, Emory University, Sept. 2015 – May 2019. Now an Assistant Professor at Colorado School of Mines.

James Herring, *Numerical Methods for Coupled Optimization Problems* (with Dr. James Nagy), PhD in Computational Mathematics, Emory University, June 2016 – May 2018. Now a senior researcher at Numerica Corp. in Fort Collins, CO.

Alex Dunbar, *Tropical Geometry and Machine Learning*, PhD in Computational Mathematics, Emory University, 2019 – 2024. Now Postdoctoral Fellow at Georgia Tech.

Supervision of Visiting Students

Xiangxi Gao, *Numerical Methods for Parameter Estimation*, Sept. 2017 - Sept. 2018. Now a PhD student at Emory.

Jan Macdonald, *Numerical Optimization for EPI-MRI Susceptibility Artifact Correction*, Sept. 2015 – May 2016. Now a PhD student at TU Berlin.

Maximilian März, *Inverse Problems in Quantitative Susceptibility Mapping*, Sept. 2014 – May 2015. Now a PhD student at TU Berlin.

Honors Thesis Committees

(my own students are listed above)

Rishi Leburu, Mathematics, March 2026
Aileen He, Mathematics, March 2024
Zoe Ji, Mathematics, March 2024
Jafer Hasnain, Mathematics, March 2024
Kai Chang, Mathematics, March 2023
Owen Yang, Computer Science, March 2023
Mai Phuong Pham Huynh, Mathematics, March 2022
Jonathan Valyou, Mathematics, March 2022
Jennifer Zhang, Mathematics, March 2022
Sihan Yue, Mathematics, March 2019
Siqi Xue, Mathematics, March 2017
Robert Bamford, Economics, March 2017

Graduate Thesis Committees

(my own students are listed above)

Tobias Alt, Mathematics, University of Saarbruecken, December 2022
Junxiang Wang, Computer Science and Informatics, November 2022
Jan MacDonald, Mathematics, TU Berlin, November 2022
James Morrill, Mathematics, Oxford University, March 2022
Chang Meng, Computational Mathematics, March 2022
Yuliang Ji, Computational Mathematics, March 2022
Ru Huang, Computational Mathematics, March 2022
Dominik Buenger, Mathematics, TU Chemnitz, November 2021
Ferdia Sherry, Mathematics, Cambridge University, October 2021
Alessandro Barone, Computational Mathematics, October 2019
Blair Rosetti, Computer Science and Informatics, March 2019
Sofia Guzzetti, Computational Mathematics, March 2019
Yunyi Hu, Computational Mathematics, April 2019
Clarissa Garvey, *Truncated SVD of Structured Matrices via Kronecker Product Summation Decomposition*,
Computer Science and Informatics, May 2018

Postdoctoral Mentees

Kelvin Kan, Postdoctoral Fellow, Emory University, July 2023 – June 2024; Now Visiting Assistant Professor at UCLA.

Nicole Yang, Postdoctoral Fellow, Emory University, since August 2022; Starting as assistant professor at University of Tennessee Knoxville in Fall 2025.

Deepanshu Verma, Postdoctoral Fellow, Emory University, August 2021 – August 2024; Now assistant professor at Clemson.

Elizabeth Newman, Postdoctoral Fellow, Emory University, June 2019 – September 2022; Now assistant professor at Emory.

Bas Peters, Postdoctoral Fellow, Emory University, August 2020 – July 2021.

Lauri Mustonen, Postdoctoral Fellow, Emory University, November 2017 – September 2018; Now postdoc at Stanford University since Oct. 2018.

Conference, Workshop, and Mini-Symposium Organization

Co-organizer of Future of AI and the Mathematical and Physical Sciences (AI+MPS) Conference, March 2025 at MIT (supported by a \$100,000 Conference Award by NSF).

Co-organizer of the NSF Computational Mathematics PI Meeting, Utah, May 2025 (supported by a \$100,000 Conference Award by NSF).

Co-organizer of mini symposium on Continuous-in-time Learning for and with Deterministic and Stochastic Dynamics at SIAM Conference on Mathematics of Data Science, Atlanta, 2024.

Organizing Committee Member, SIAM Conference on Uncertainty Quantification, Trieste, Italy, Spring 2024.

Co-chair of the SIAM Conference on Mathematics of Data Science, hybrid, San Diego, Fall 2022.

Co-organizer of workshop on *Theory of Deep Learning* at the Isaac Newton Institute for Mathematical Sciences, University of Cambridge, UK, August 2021.

Co-organizer of workshop on *Optimization under Uncertainty: Learning and Decision Making* at the Banff International Research Station, CAN, February 2021 (virtual)

Co-organizer of two-part mini-symposia on *Advances in Machine Learning and Data-driven Methods for Computational Science* at the SIAM Conference on Mathematics of Data Science, Cincinnati, OH, May 2020 (virtual).

Lecturer of a five-hour mini-course on *Numerical Methods for Deep Learning* at the school on *Mathematical and Computational Aspects of Machine Learning* held at the Scuola Normale Superiore, Pisa, Italy, October, 2019.

Co-organizer of two-part mini-symposia on *Mathematical Advances in Deep Learning* at the SIAM Conference on Computer Science and Engineering, Spokane, WA, February 2019.

Lecturer at Summer School on Applied Analysis on *Numerical Methods for Deep Learning*, Chemnitz, Germany, September 2018.

Chair of focus session on *Machine learning and PDEs* at the 5th European Conference on Computational Optimization – EUCCO 2018, Trier, Germany, September 2018.

Co-organizer of mini-symposia on *Computational Methods for Large-Scale Machine Learning in Imaging* at the SIAM Conference on Imaging Sciences, Bologna, Italy, June 2018.

Co-organizer of two-part mini-symposia on *Preconditioning Methods in Large-Scale Ill-Posed Inverse Problems* at the International Conference on Preconditioning Techniques, Vancouver, Canada, Aug 2017.

Co-organizer of mini-symposia on *PDE-Constrained Optimization with Reduced Order Models* at the SIAM Conference on Optimization, Vancouver, Canada, May 2017.

Co-organizer of mini-symposia on *Advanced Scientific Computing using Julia* at the SIAM Conference on Computer Science and Engineering, Atlanta, GA, March 2017.

Workshop on *Numerical Methods for PDE Constrained Optimization*, Doktorandenkolleg in Weissensee, Austria, September 2016.

Tutorial on *Tutorial on Distributed Optimization for Full Waveform Inversion in Julia* (with Eldad Haber), Platform for Advanced Scientific Computing, Zurich, CH, June 2015

Mini-symposium on *Large-Scale Scientific Computing with Julia* at the Platform for Advanced Scientific Computing, Zurich, CH, June 2015

Co-organizing mini-symposia on *Parametric Model Reduction and Inverse Problems* at the SIAM Conference on Computer Science and Engineering, Salt Lake City, March 2015.

Co-organizing mini-symposia on *High-level technical computing with Julia* to be held at the SIAM Conference on Computer Science and Engineering, Salt Lake City, March 2015.

Co-organized mini-symposium on *Numerical Methods for Large-Scale Imaging Problems* held at the SIAM Conference on Imaging Science, Hong Kong, 2014

Course on Medical Image Registration with Jan Modersitzki and Lars König by invitation of The Fields Institute Toronto, 2012

Fully responsible for special topic lecture on Susceptibility Artifact correction of EPI-MRI and organization of two computer labs (4 hours each).

Workshop on Image Registration with Jan Modersitzki and Fabian Gigengack, 14th International Conference on Medical Image Computing and Computer Assisted Intervention, Toronto, 2011, *Fully responsible for special topic lecture on Susceptibility Artifact correction of EPI-MRI.*

Summer School on Image Registration with Jan Modersitzki, by invitation of the Swedish Society for Automated Image Analysis (SSBA), Linköping, Sweden, 2011, *Fully responsible for four computer labs (3 hours each).*

Workshop on Image Registration with Jan Modersitzki and Fabian Gigengack, by invitation of Medical Visualisation Network (MedViz) at University of Bergen, Norway, 2011, *Fully responsible for a four hour computer lab.*

Awards and Grants (titles of current support where I am lead PI are in bold)

NSF/BSF DMS 2411264: Scalable Graph Neural Network Algorithms and Applications to PDEs, funded by the US National Science Foundation, total budget \$374,988.00, August 2024 – July 2027.

ONR N000142412221: Mixed-Precision Algorithms for Training Deep Neural Networks, funded by the Office of Naval Research, total budget \$300,000, March 2024 – February 2027.

NSF DMS 2349534: REU Site for Computational Mathematics for Data Science, funded by the US National Science Foundation, total budget \$455,000, May 2024 – April 2027.

NSF DMS 2038118 (co-PI): RTG: Computational Mathematics for Data Science, funded by the US National Science Foundation, total budget \$1,320,195.00, June 2021 – May 2026.

NSF DMS 2051019: REU/RET Site for Computational Mathematics for Data Science, funded by the US National Science Foundation, Co-PI Bree Ettinger, total budget \$397,178, May 2021 – April 2024.

Active and Reinforcement Learning for Decision Support, subcontract with Sandia National Laboratories funded as part of a collaborative DOE ASCR proposal, Emory budget \$600,000, October 2020 – September 2023

A Machine Learning Framework for High-Dimensional Mean Field Games and Real-Time Control, US Air Force Office of Scientific Research FA9550-20-1-0372, total budget \$449,141, September 2020 – September 2024

CAREER DMS 1751636: A Flexible Optimal Control Framework for Efficient Training of Deep Neural Networks, funded by NSF Computational Mathematics, total budget \$400,000, June 2018 - May 2025.

New Architectures and Algorithms For Continuous Convolutional Neural Networks, funded by the US Israeli Binational Science Foundation. Emory budget \$74,999, Oct 2019 – Sept. 2021.

Efficient training of stochastic Neural ODEs and ResNets via weight parametrization, contract funded by Sandia National Laboratories, Emory budget \$60,000, January 2022 – December 2022.

Data-driven surrogate models of complex physical simulators, subcontract funded by Sandia National Laboratories, Emory budget \$120,000, April 2019 – August 2020.

Bayesian Algorithms for disambiguation of wgMLST types in culture-independent diagnostic samples funded by the Centers for Disease Control, Co-PIs Dr. Rebecca Mitchell and Dr. Ymir Vigfusson, total budget \$382,383, Sep 2017 - Sep 2018.

NVIDIA GPU Grant for a TitanX, May 2017.

Numerical Methods for Quantitative MRI funded by Emory University Research Council, total budget \$30,000, April 2016.

[DMS 1522599: Fast Algorithms for Solving Big Data PDE Parameter Estimation Problems on Cloud Computing Platforms](#) funded by NSF Computational Mathematics, total budget \$179,999, Sept. 2015 - Sept. 2018.

IdeaLab2015, travel award to attend one-week workshop at ICERM, Providence, RI, July 2015.

Award for the best scientific contribution at *Bildverarbeitung für die Medizin* (Workshop on Medical Imaging), Berlin, Germany, 2012

Research grant (principal investigators Jan Modersitzki and Martin Burger), *Nonlinear mass-preserving registration for MRI and PET*, funded for two years with an equivalent of about \$183,500 by the *Deutsche Forschungsgemeinschaft* (German Research Foundation).

Professional Activities

Chair, SIAM Activity Group on Data Science, 2024–2025.

Vice Chair, SIAM Activity Group on Data Science, 2022–2024.

Secretary, SIAM Activity Group on Imaging Science, 2018–2020.

Section Editor, [SIAM Journal on Scientific Computing](#) section on Machine Learning methods for Scientific Computing, since January 2023

Associate Editor

[SIAM Review](#), since January 2022

[SIAM Journal on Scientific Computing](#), January 2021 – December 2022

Guest editor

Royal Mathematical Society Special Issue on PDEs for Machine Learning, 2021

European Journal of Applied Mathematics special issue on Deep Learning and PDEs, 2020 – 2021

Reviewer for several journals, including:

[Proceedings of the National Academy of Sciences](#)

[SIAM Journal on Scientific Computing](#)

[SIAM Journal of Matrix Analysis](#)

[SIAM Journal on Applied Dynamical Systems](#)

[Journal of Mathematical Imaging and Vision](#)

[Journal of Visual Communication and Image Representation](#)

[Magnetic Resonance in Medicine](#)

[Journal of Computational Physics](#)

IEEE Transaction on Medical Imaging
International Journal on Computer Mathematics
Inverse Problems
Medical Image Analysis
Numerical Linear Algebra with Applications
Applied Mathematical Modeling
Communications in Applied and Industrial Mathematics
Optimization and Engineering
Numerical Algorithms

Reviewer for several conferences, including:

Conference on Learning Theory (COLT), 2021
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021
International Conference on Scale Space and Variational Methods in Computer Vision (SSVM) 2019
International Conference on Machine Learning (ICML) 2019

Reviewer and panelist for federal funding agencies:

European Research Council
Swiss National Supercomputing Centre
Deutsche Forschungsgemeinschaft (German Research Foundation, DFG)
US National Science Foundation, Division of Mathematics
US Department of Energy

Member of Program Committee

Mathematical and Scientific Machine Learning 2021
Mathematical and Scientific Machine Learning 2020
IEEE 18th International Conference on CSE 2015 and 2016.

Member of the American Mathematical Society.

Member of the Society for Industrial and Applied Mathematics (SIAM).

Member of the Deutsche Mathematiker-Vereinigung (DMV).

Member of the Gesellschaft für Angewandte Mathematik und Mechanik e.V. (GAMM).